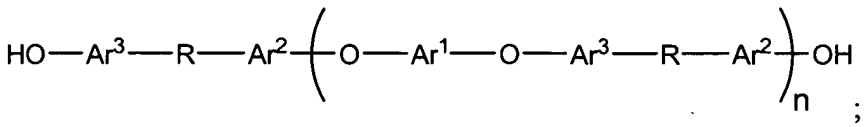
CLAIMS

What is claimed is:

1. An oligomer comprising the formula:



;

wherein Ar^1, Ar^2, and Ar^3 are independently selected divalent aromatic radicals selected from the group consisting of a substituted or unsubstituted aromatic ring, substituted or unsubstituted fused aromatic rings, and a substituted or unsubstituted aromatic ring assembly without intervening groups;

R is a substituted or unsubstituted divalent organic or sulfone group; and

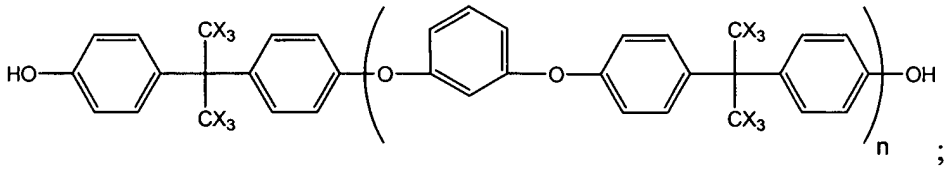
wherein n is a positive integer.

2. The oligomer of claim 1, wherein Ar^1, Ar^2, and Ar^3 are phenyl groups.

3. The oligomer of claim 1, wherein R is selected from the group consisting of 2,2-isopropylidene and hexafluoro-2,2-isopropylidene.

4. The oligomer of claim 1, wherein n is from 1 to 10.

5. The oligomer of claim 1, wherein the oligomer is:



;

wherein each X is independently selected from the group consisting of H and F.

6. A process comprising the steps of:
providing a dihydroxyaromatic compound;
providing a dihaloaromatic compound; and
reacting the dihydroxyaromatic compound with the dihaloaromatic compound in the presence of a copper compound and a base other than cesium carbonate.

7. The process of claim 6, wherein the dihaloaromatic compound has halo groups that are not activated by an electron withdrawing group.

8. The process of claim 6, wherein the dihydroxyaromatic compound is selected from the group consisting of a phenyl, resorcinol, a bisphenol, bisphenol A, bisphenol A6F, bisphenol S, a dihydroxybenzene, and a dihydroxybiphenyl.

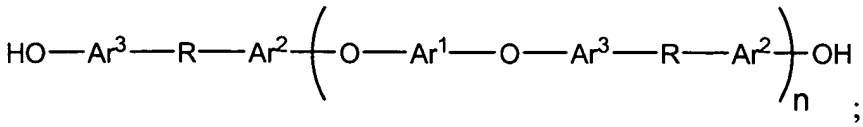
9. The process of claim 6, wherein the dihaloaromatic compound is selected from the group consisting of a dihalobenzene, a dihalobenzophenone, a 4,4'-benzophenone, and a diphenyl sulfone.

10. The process of claim 6, wherein the base is potassium carbonate.

11. The process of claim 6, wherein the base is selected from the group consisting of a carbonate, a strong base, potassium hydroxide, sodium hydroxide, and lithium hydroxide.

12. The process of claim 6, wherein the copper compound is selected from the group consisting of copper (I) iodide, copper (I) bromide, and copper (I) chloride.

13. The process of claim 6, wherein the process produces a compound comprising the formula:



wherein an excess of dihydroxyaromatic compound is used;

wherein Ar^1, Ar^2, and Ar^3 are independently selected divalent aromatic radicals selected from the group consisting of a substituted or unsubstituted aromatic ring, substituted or unsubstituted fused aromatic rings, and a substituted or unsubstituted aromatic ring assembly with or without intervening groups;

R is a substituted or unsubstituted divalent organic or sulfone group; and

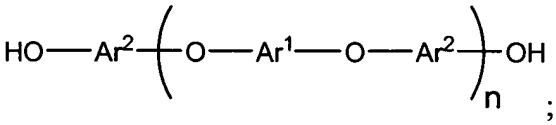
wherein n is a positive integer.

14. The process of claim 13, wherein Ar^1, Ar^2, and Ar^3 are phenyl groups.

15. The process of claim 13, wherein R is selected from the group consisting of 2,2-isopropylidene and hexafluoro-2,2-isopropylidene.

16. The process of claim 13, wherein n is from 1 to 10.

17. The process of claim 6, wherein the process produces a compound comprising the formula:



wherein an excess of dihydroxyaromatic compound is used;

wherein Ar^1 and Ar^2 are independently selected divalent aromatic radicals selected from the group consisting of a substituted or unsubstituted aromatic ring, substituted or unsubstituted fused aromatic rings, and a substituted or unsubstituted aromatic ring assembly without intervening groups; and

wherein n is a positive integer.

18. The process of claim 17, wherein Ar^1 and Ar^2 are phenyl groups.

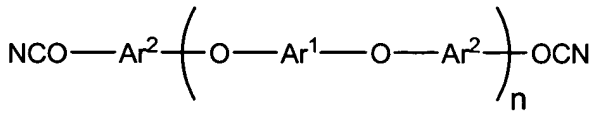
19. The process of claim 17, wherein n is from 1 to 10.

20. The process of claim 6,

wherein an excess of dihydroxyaromatic compound is used; and

further comprising the step of reacting the product of reacting the dihydroxyaromatic compound with the dihaloaromatic compound with a hydroxyaromatic in the presence of a copper compound and a base other than cesium carbonate.

21. A cyanate ester comprising the formula:



wherein Ar^1 and Ar^2 are independently selected divalent aromatic radicals selected from the group consisting of a substituted or unsubstituted aromatic ring, substituted or unsubstituted fused aromatic rings, a substituted or unsubstituted aromatic ring assembly with or without intervening groups, and combinations thereof, with the proviso that when Ar^2 is a bisphenol A residue, then Ar^1 is neither a benzophenone residue nor a diphenyl sulfone residue; and

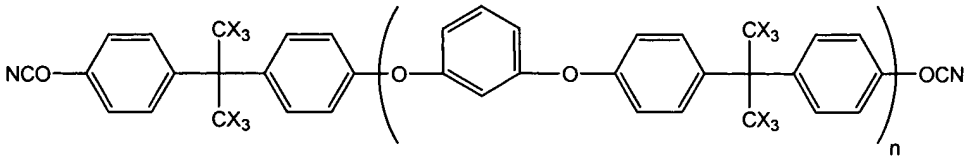
wherein n is a positive integer.

22. The cyanate ester of claim 21, wherein Ar^1 is selected from the group consisting of a phenyl, an m-phenyl, p-phenyl, o-phenyl, a benzophenone residue, a 4,4'-benzophenone residue, and a diphenyl sulfone residue.

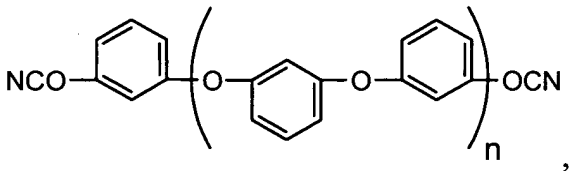
23. The cyanate ester of claim 21, wherein Ar^2 is selected from the group consisting of a phenyl, an m-phenyl, a biphenyl, a 4,4'-biphenyl, and a bisphenol residue.

24. The cyanate ester of claim 21, wherein n is from 1 to 10.

25. The cyanate ester of claim 21, wherein the cyanate ester is selected from the group consisting of:



wherein each X is independently selected from the group consisting of H and F,



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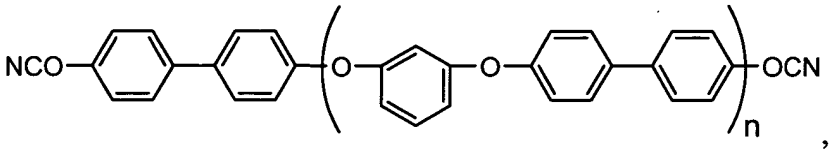

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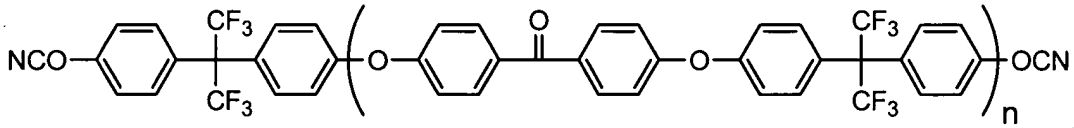
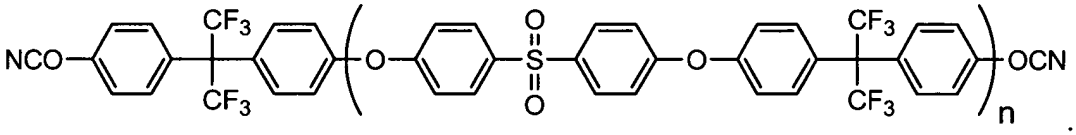


, and



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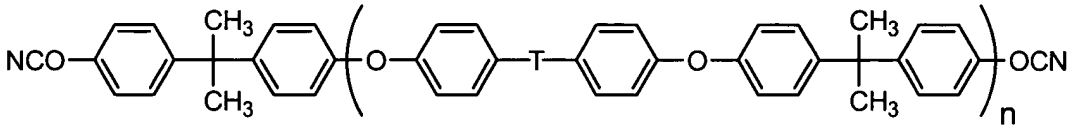
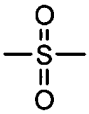
26. A cyanate ester comprising the formula:

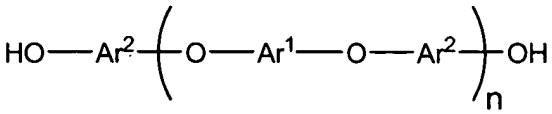


wherein T is selected from the group consisting of  and  ; and

wherein n is a positive integer from 1 to 5.

27. A process comprising the steps of:

providing an oligomer comprising the formula:



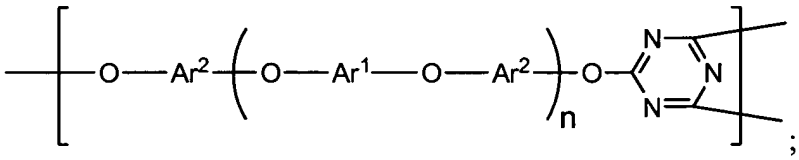
wherein Ar^1 and Ar^2 are independently selected divalent aromatic radicals selected from the group consisting of a substituted or unsubstituted aromatic ring, substituted or unsubstituted fused aromatic rings, a substituted or unsubstituted aromatic ring assembly without intervening groups, and combinations thereof; and

wherein n is a positive integer; and

reacting the oligomer with a cyanide compound in the presence of a base to form -OCN end groups on the oligomer.

28. The process of claim 26, wherein the cyanide compound is cyanogen bromide.

29. A thermoset comprising the formula:



wherein Ar^1 and Ar^2 are independently selected divalent aromatic radicals selected from the group consisting of a substituted or unsubstituted aromatic ring, substituted or unsubstituted fused aromatic rings, a substituted or unsubstituted aromatic ring assembly with or without intervening groups, and combinations thereof; and

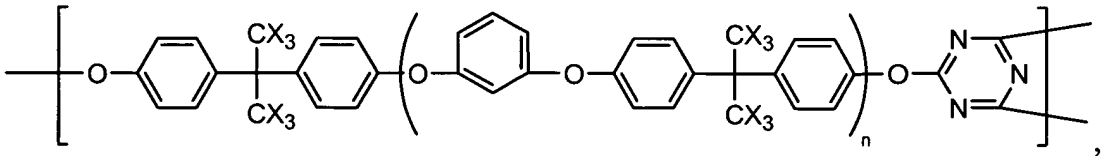
wherein n is a positive integer.

30. The thermoset of claim 29, wherein Ar^1 is selected from the group consisting of a phenyl, an m-phenyl, a benzophenone residue, a 4,4'-benzophenone residue, and a diphenyl sulfone residue.

31. The thermoset of claim 29, wherein Ar^2 is selected from the group consisting of a phenyl, an m-phenyl, a biphenyl, a 4,4'-biphenyl, and a bisphenol residue.

32. The thermoset of claim 29, wherein n is from 1 to 10.

33. The thermoset of claim 29, wherein the cyanate ester is selected from the group consisting of: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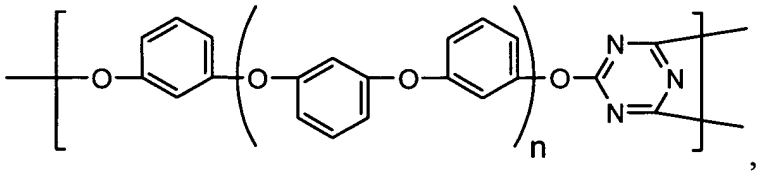
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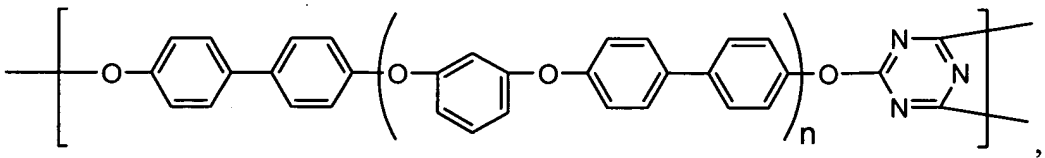
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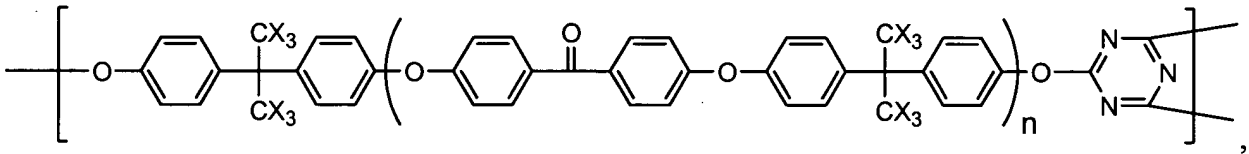
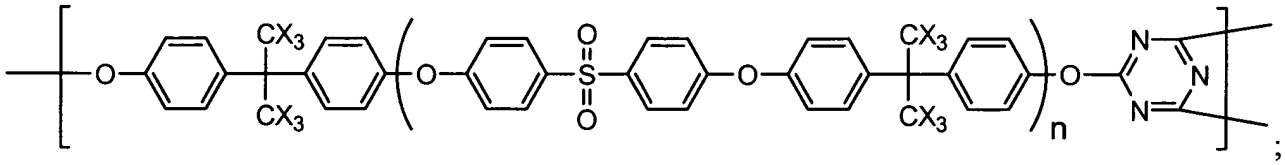
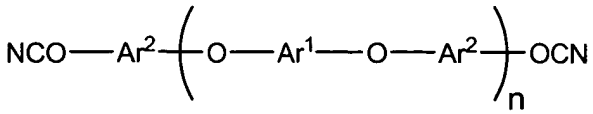

, and


;

wherein each X is independently selected from the group consisting of H and F.

34. A process comprising the steps of:

providing a cyanate ester comprising the formula:



wherein Ar^1 and Ar^2 are independently selected divalent aromatic radicals selected from the group consisting of a substituted or unsubstituted aromatic ring, substituted or unsubstituted fused aromatic rings, a substituted or unsubstituted aromatic ring assembly with or without intervening groups, and combinations thereof; and

wherein n is a positive integer; and

curing the cyanate ester to a thermoset.

35. The process of claim 34, wherein the curing is done by heating the cyanate ester.

36. The process of claim 34, wherein the curing is done in the presence of a curing additive selected from the group consisting of a metal acetylacetonate, a transition metal salt, copper (II) acetylacetonate, chromium (III) acetylacetonate, manganese (III) acetylacetonate, 1,3-bis(3-aminophenoxy)benzene, alcohol, a phenol, and amine.